

Problem Solving

The Art & Science of Knowing What to Do

Federal Emerging Leader Development Course

April 2023



How do you
solve problems?

Your best
practice ideas



A Template for Problem-Solving

To be an effective problem solver:

- 1) Figure out, and regularly re-articulate, your goals, purposes, and needs. **Recognize problems** as obstacles to reaching your goals, achieving your purposes, or satisfying your needs.
- 2) Wherever possible **take problems one by one**. State each problem as clearly and precisely as you can.
- 3) **Study the problem** to determine the “kind” of problem you are dealing with. For example, what do you have to do to solve it?
- 4) **Distinguish problems** over which you have some control from problems over which you have no control. Concentrate your efforts on problems you can potentially solve.
- 5) Figure out the information you need to solve the problem. Actively seek that information.
- 6) Carefully analyze and interpret the information you collect, drawing reasonable inferences.
- 7) Determine your options for action. What can you do in the short term? In the long term? Recognize your limitations in terms of money, time, and power.
- 8) Evaluate your options, determining their advantages and disadvantages.
- 9) Adopt a strategy. Follow through on it. This may involve direct action or a carefully thought-through wait-and-see approach.
- 10) When you act, monitor the implications of your action. Be ready to revise your strategy if the situation requires it. Be prepared to change your analysis or statement of the problem, as more information about the problem becomes available.



Problem Solving Models

7 Step Problem Solving Process

1. Identify the issues.
2. Understand everyone's interests.
3. List the possible solutions (options)
4. Evaluate the options
5. Select an option or options
6. Document the agreement
7. Agree on contingencies, monitoring, and evaluation

LSU School of Nursing

1. Define the Problem
2. Determine the Root Cause(s) of the Problem
3. Develop Alternative Solutions
4. Select a Solution
5. Implement the Solution
6. Evaluate the Outcome

USC Marshall

1. Identify the problem
2. Analyze the problem
3. Identify decision criteria
4. Develop multiple solutions
5. Choose the optimal solution

Polya's Model

1. Understand the problem
2. Devise a plan
3. Carry out the plan
4. The key is to keep trying until something works,
Verification: Look back.

“A” Problem Solving Model

1. *Identify the Problem*

2. Gather Information

3. Develop Criteria

4. Generate Possible Solutions

- a. Screening and Evaluation Criteria that are based on Facts and Assumptions
- b. Brainstorm and Generate Solutions

5. Analyze and Compare Possible Solutions

6. Select Best Possible Solution

7. Implement and Assess the Decision

How do you IDENTIFY THE PROBLEM?



Into the Breakout Areas

Group One

Group Two

“HOW WE IDENTIFY THE PROBLEM”

About 20 minutes

Capture your best ideas and be prepared to
present your ideas to the entire group.

Problem

a question raised for inquiry, consideration, or solution
an intricate unsettled question
a source of perplexity, distress, or vexation

Merriam Webster

A perceived gap between the existing state and a desired state,
or a deviation from a norm, standard, or status quo.

BusinessDictionary.com

What prevents you from reaching your goal?

Studggs.net

Albert Einstein once said, “If I were given one hour to save the planet, I would spend 59 minutes defining the problem and one minute resolving it.”

What Method Did You Use . . .

Did You
Brainstorm
?



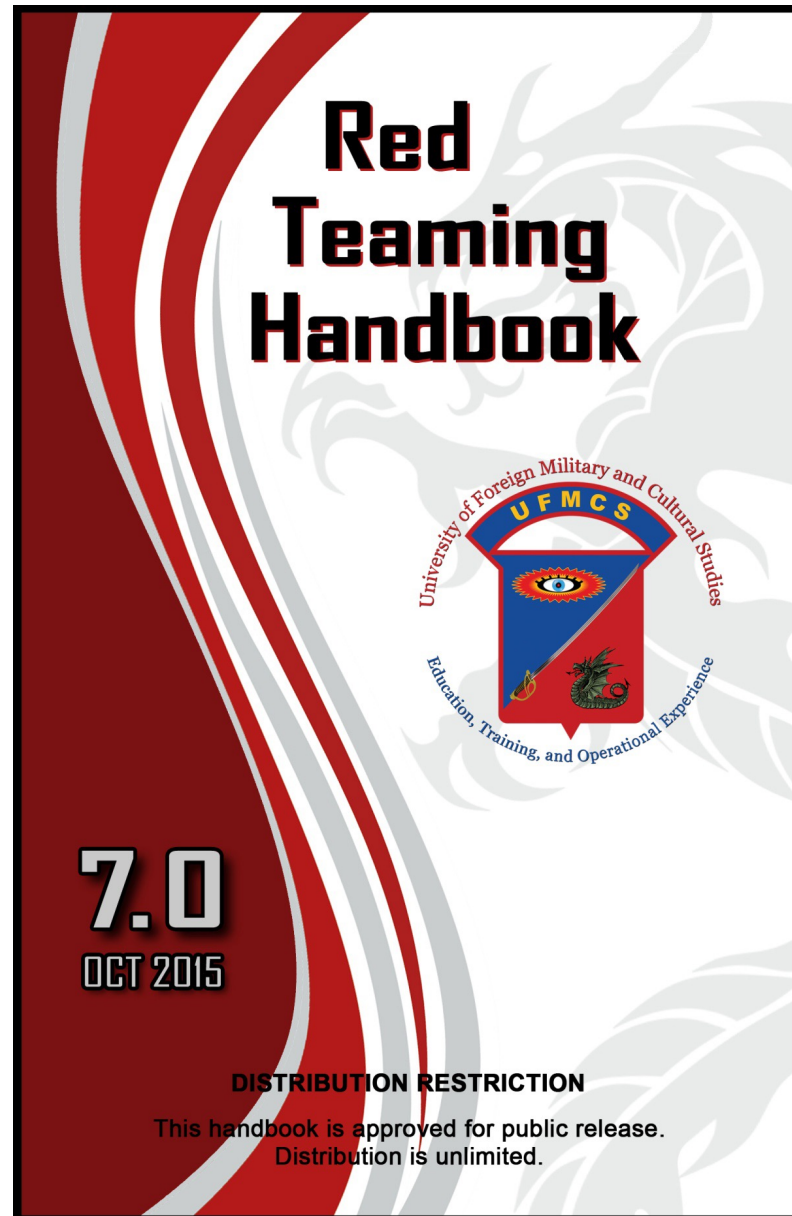
. . .To Identify THE Problem?

- 4 Ways of Seeing
- 6 Empathetic Questions
- Contrarian Techniques
- Devil's Advocacy
- High-Impact / Low-Probability Analysis
- Team A / Team B
- What if? Analysis

And Several Others



Consulting Group LLC



Brain Storming Process

Phase I – Generating “Rules for Brainstorming”

- No Criticism or Evaluation
- Far-Fetched Ideas are Encouraged
- Many Ideas are Desirable
- Duplication is OKAY

Phase II – Evaluation “Ban or Criticism Over”

- Team Evaluates Their Ideas; Selects the Best Ones
- Compare and Combine Ideas
- Make a Final List of Ideas and Rank Order Best Based on Feasibility

Phase III – Determination of Final Choice

BREAK



What To Look For When Identifying Problems:

- Problems prevent the goals and objectives from being achieved.
- Problem identification should consider not only ‘problems’ or ‘challenges’, but also constraints on opportunities that are preventing the goals and objectives from being achieved.
- Identification should be based on empirical observations, such as data and information obtained from surveys, demand modelling, interviews and studies from a wide range of sources.
- Problem identification should result in problem statements that describe the nature of the problem and its components.

Scoping The Problem

- The scope of a problem should be defined by what is preventing the achievement of the objectives.
- Problem identification should not be confined to existing situations or issues. Emerging and potential future problems should also be considered.
- Problems can be different for the various planning levels.
- Problems should be seen as multidimensional. It is important to 'cast the net wide' when identifying problems. This means considering the full range of economic, social and environmental factors and canvassing a broad spectrum of potential problems.

WHAT KIND OF PROBLEM ARE YOU SOLVING?



Different types of problems require different approaches.

Types of Problems

	<i>Well-structured</i>	<i>Medium-structured</i>	<i>Ill-structured</i>
Problem Structuring	The problem is self-evident.	Professionals easily agree on its structure.	Professionals have difficulty agreeing on problem structure and will have to agree on a shared hypothesis.
Solution Development	Solution techniques are available and there are verifiable solutions.	There may be more than one “right” answer. Professionals may disagree on the best solution. A desired end state can be agreed on.	Professionals will disagree on— <ul style="list-style-type: none"> • How the problem can be solved. • The most desirable end state. • Whether the end state can be attained.
Execution of Solution	Success requires learning to perfect technique.	Success requires learning to perfect techniques and to adjust the solution.	Success requires learning to perfect technique, adjust the solution, and continuously refine understanding of the problem.
Adaptive Iteration	No adaptive iteration required.	Adaptive iteration is required to find the best solution.	Adaptive iteration is required both to refine the problem and to find the best solution.

What Type of Problem is This?



Types of Problems

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Design

Design is a methodology for applying critical and creative thinking to understand, visualize, and describe problems and approaches to solving them.

Design methodology is particularly useful as an aid to conceptual thinking about unfamiliar problems.



- Problem Identification
- Conceptual-Blank Sheet
- Questions Assumptions and Methods
- Develops Understanding
- Paradigm-Setting
- Complements planning, preparation, implementation and assessment
- Leader-Driven Dialogue

- Problem-Solving
- Physical and Detailed
- Procedural
- Develops Products
- Paradigm-Accepting
- Pattern and Template Activities
- Staff-Centered Process

What Is the Problem



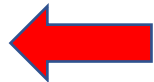
Decide /
Act



Reframe



Planning



Well Structured /
Medium Structured



Problem Solving

Problem Solving Models

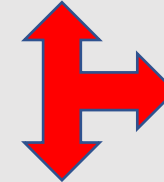
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<u>USC Marshall</u>		<u>Polva's Model</u>	
1.	Identify the problem	1.	Understand the problem
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5.	Choose the optimal solution		Verification: Look back.

Ill-Structured



Current State

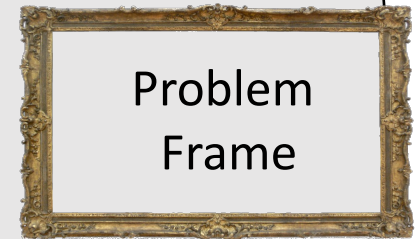


Future State

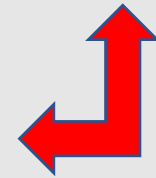


"DESIGN"

Problem
Frame



Operational
Approach



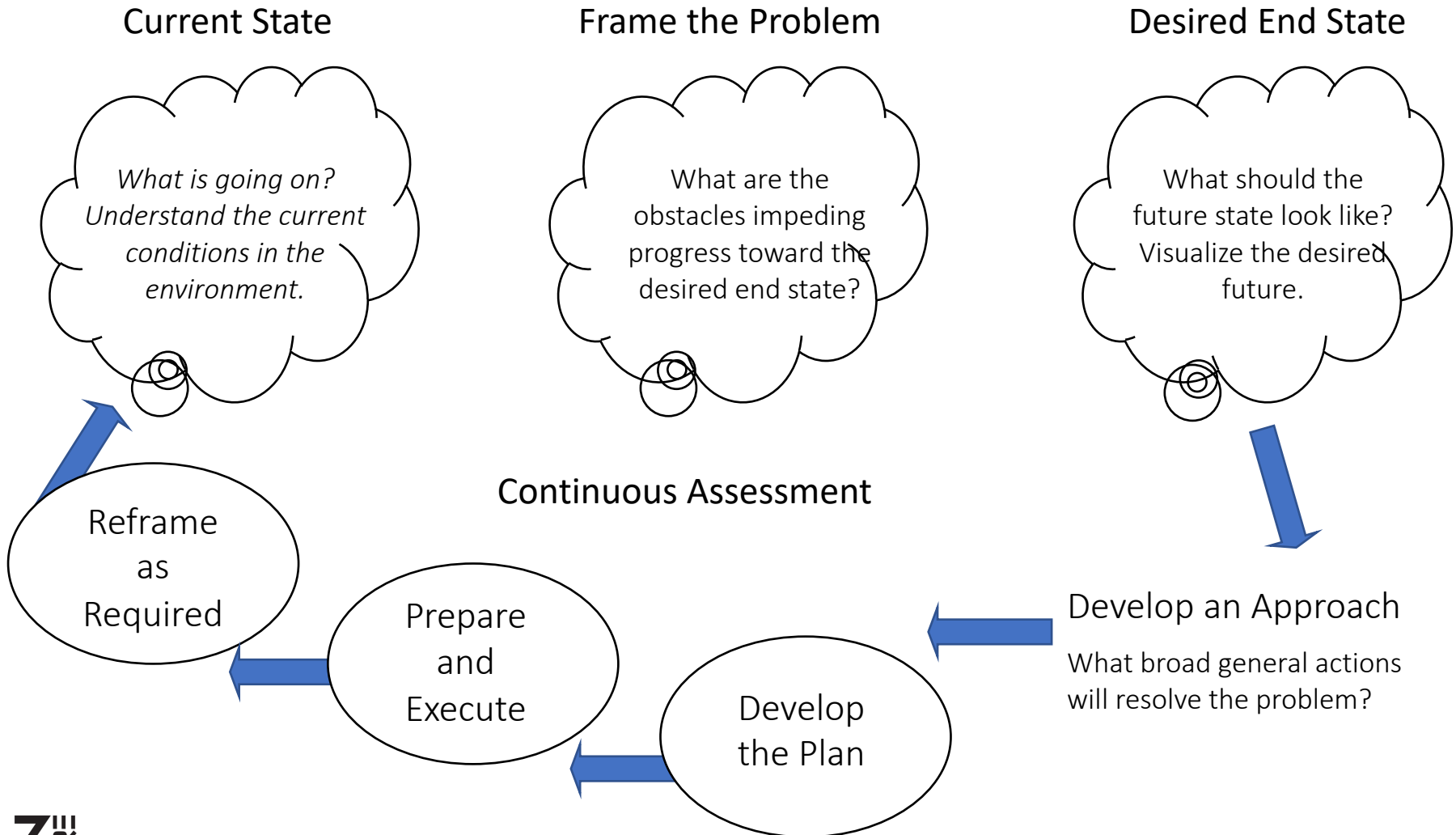
Where to Start??



Framing

Framing is the *art of seeing the essential and relevant among the trivial and irrelevant*; understanding the logic of the broadly received requirement and its messy contextual situation; and reshaping it into a well-enough structured working hypotheses. It requires leaders to inquire into the nature or character of the factors—stakeholders, opponents, and the larger organizational environment—which defines the situation in which a problem can be recognized.

Frame the Environment



Design Framing Approach. . .

Current State

*“What is going on in
the current
environment?”*

1

Desired End State

*“What do we want the
future environment to
look like?”*

2

Problem Frame

*“What are the obstacles
preventing the current
state from becoming the
desired end state?”*

3

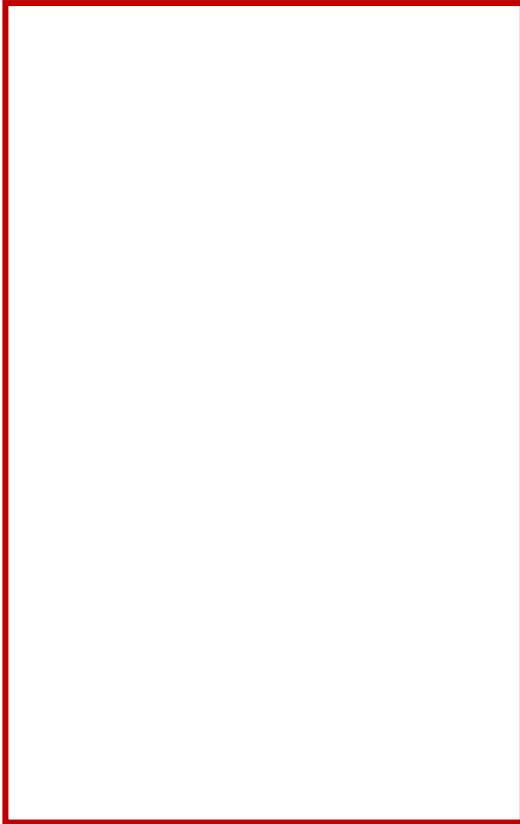
Operational Approach

*“How do we get from the
current state to our
desired end state?”*

4

Framing

Current State



Barriers

-
-
-
-
-
-
-

Future State



Current State

Fifty million Americans currently suffer from a lack of food.



Future State

A country where safe, high-quality foods are available for every person regardless of circumstance.

Operational Approach

Current State

1 In 6 People

1 In 5 Children

50 Million Total

1 Farmer Feeds 155

Exports Highest in History

Highest GDP

Lowest Unemployment

Best Health Care

Barriers

Poverty

Drugs

Social Programs

Joblessness

Education

Transportation

Future State

No Person Hungry

Zero Deaths to
starvation

Zero Malnutrition

Zero related diseases

Lines of Effort

Problem Statement

A problem statement should describe an undesirable gap between the current-state and the desired future-state. A problem statement *should* include *absolute or relative measures of the problem that quantify* that gap but *should not* include possible causes or solutions!

Current State

Fifty million Americans currently suffer from a lack of food.

Problem Frame

An unacceptable percentage of the US population suffers from a lack of healthy and consistently available food

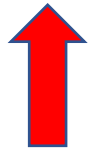
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What Is the Problem



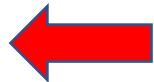
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Problem Solving

Problem Solving Models

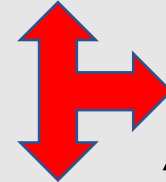
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Ill-Structured



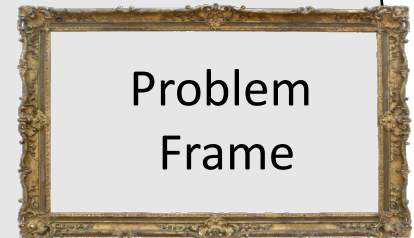
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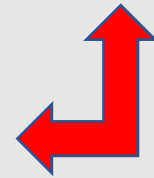
Future State



"DESIGN"



Operational
Approach



Operational Approach

Current State

1 In 6 People

1 In 5 Children

50 Million Total

1 Farmer Feeds 155

Exports Highest in History

Highest GDP

Lowest Unemployment

Best Health Care

Barriers

Poverty

Drugs

Social Programs

Joblessness

Education

Food Distribution

Future State

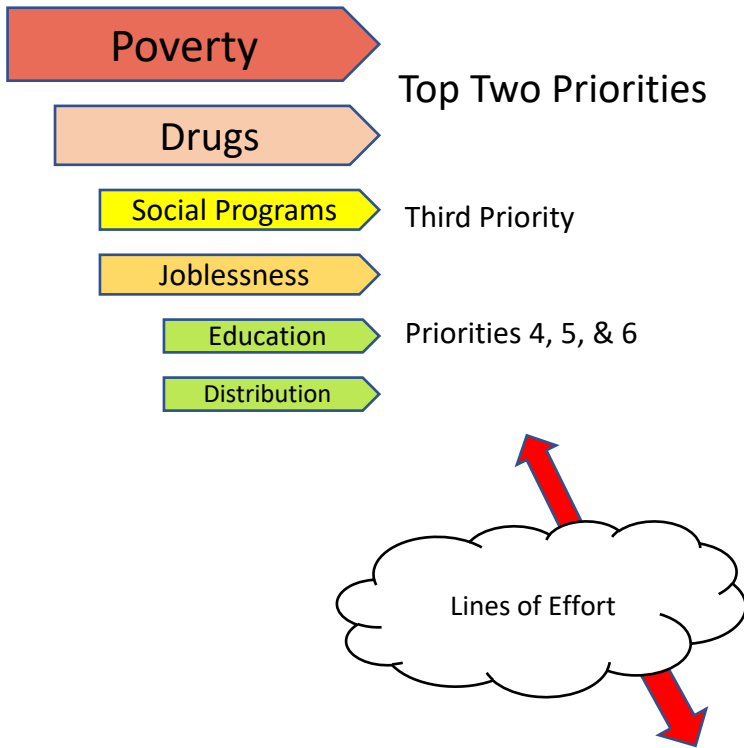
No Person Hungry

Zero Deaths to
starvation

Zero Malnutrition

Zero related diseases

Lines of Effort



*Not all problem solving is
decision making
But all decision making
involves problem solving.*

Operational Approach

Problem Frame

An unacceptable percentage of the US population suffers from a lack of healthy and consistently available food.

Lines of Effort

1. Poverty

2. Drugs

3. Social Programs

For Action

- Agency
- Task Force
- Department

Problem Solving

Break



Practical Exercise

Issue: Lack Of Transparency In Leadership

- Leaders who aren't transparent with their employees about changes or problems in the company create a sense of uncertainty and negatively impact the workplace culture.
- Transparency requires honesty, openness, and leaders to be forthcoming about their decisions and challenges.
- Being transparent also includes being fair and objective in supporting all team members and applying policies uniformly.

Medium-Structured Problem

- Professionals easily agree on its structure.
- There may be more than one “right” answer.
- Professionals may disagree on the best solution.
- A desired end state can be agreed upon.
- Success requires learning to perfect techniques and to adjust the solution.
- Adaptive Iteration is required to find the best solution.

- Group A
- Group B
- Group C
- Group D

Complete the following tasks:

1. Include Framing to assist in determining Problem Statement
2. Generate a Problem Statement
3. Use the first three steps of the USC Marshall Problem Solving Model
4. Capture your results
5. Be prepared to present your findings to the entire class.

Framing

Current State

Leaders aren't;

transparent with
their employees

forthcoming about
their decisions and
challenges

fair or objective

supporting all team
members by
applying policies
uniformly

Barriers

-
-
-
-
-
-

Future State



Problem Frame (Statement)

Problem Solving Model

USC Marshall

- 1. Identify the problem*
- 2. Analyze the problem*
- 3. Identify decision criteria*
- 4. Develop multiple solutions*
- 5. Choose the optimal solution*

The Root Cause(s) of the Problem is:



Problem Analysis:



Decision Criteria:



Lack of transparency in leadership

Transparency is essential to the success of any organization. Leaders who aren't transparent with their employees about changes or problems create a sense of uncertainty and negatively impact the workplace culture. Transparency requires honesty, openness, and leaders to be forthcoming about their decisions and challenges. Transparent leaders are more trustworthy and approachable, which also improves performance. It increases accountability for actions and decisions.

To create a work environment with greater transparency, have regular discussions during meetings to address any significant changes or challenges in the workplace. Similarly, involve relevant stakeholders and team members in the decision-making process. Being transparent also includes being fair and objective in supporting all team members and applying company policies uniformly.

Assistance Information



Group Briefings

Summary

Determine the Problem NOT the Symptom

“Why is it a problem?”

Understand the TYPE of Problem you are dealing with

“Choose the ‘Right’ Problem-Solving Method”

Think Better

“Broader, Systems, Implications, Consequences, Other POV”

Communicate Better

“Listening for Understanding and Asking Better Questions”

FOCUS ON THE GOAL

“Don’t get lost in the Solving ...”

Additional Sources for Critical Thinking, Problem Solving and Decision Making

- M. Neil Browne and Stuart M. Keeley, *Asking The Right Questions*
- Gary Jason, *Critical Thinking*
- Sylvan Barnet and Hugo Bedau, *Critical Thinking, Reading and Writing*
- Dietrich Doerner *The Logic of Failure*
- Peter Senge *The Fifth Discipline*
- Richard Paul and Linda Elder, *The Miniature Guide to Critical Thinking*,
- Robert Ennis, *Critical Thinking*
- Sylvan Barnet and Hugo Bedau, *Critical Thinking, Reading, and Writing*
- Morgan D. Jones, *The Thinker's Toolkit*
- Army Doctrine Reference Publication 3-0, The Army in Unified Land Operations, 22 September 2011
- Daniel Kahneman, *Thinking Fast and Slow*, New York: Farrar, Straus and Giroux, 2011
- Morgan D. Jones, *The Thinker's Toolkit* (New York: Three Rivers Press, 1998)
- Dietrich Doerner, *The Logic of Failure: Recognizing and Avoiding Error in Complex Situations* (New York: Basic Books, 1996)
- Nassim Nicholas Taleb, *The Black Swan: The Impact of the Highly Improbable* (New York: Random House, 2007).
- J. Koehler, "The Base-Rate Neglect Fallacy Reconsidered: Descriptive, Normative, and Methodological Challenges," *Behavioral and Brain Sciences* 19 (1996)
- Philip E. Tetlock, *Expert Political Judgment: How Good is It? How Can We Know?* (Princeton, NJ: Princeton University Press, 2005)
- M. Neil Browne and Stuart M. Keeley, *Asking the Right Questions: A Guide to Critical Thinking* (Upper Saddle River, NJ: Pearson Prentice Hall, 2007)
- A good example of how an analyst critically questioned a concept based upon its assumptions is found in, Antulio J. Echevarria II, *Rapid Decisive Operations – An Assumptions-Based Critique* (Carlisle: Strategic Studies Institute, 2001). Available at <http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?pubID=218>
- Gary Klein, *Sources of Power: How People Make Decisions*, Cambridge, Mass. The MIT Press, 1998